REMARKS

Claims 1-20 are pending in the instant application with claims 1, 2, 7, and 11 in independent form. No claims are presently amended, added, or cancelled. The specification has been amended to replace the existing title of the application with the new title of "Multiply Structured Particle and Method for Producing the Same". The new title is the exact same title contained in the original application as filed. No new matter has been added through the instant Amendment.

Claims 1-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Steigerwald et al., "Surface Derivatization and Isolation of Semiconductor Cluster Molecules" in view of Japanese Patent No. 6319986. The Applicants respectfully traverse the Examiner's rejections of the independent claims, namely, claims 1, 2, 7, and 11. More specifically, the Applicants respectfully assert that that the rejections over the combination of Steigerwald et al. and JP6-319986 represent impermissible hindsight reconstruction of the instantly claimed invention and, thus, are impermissible and must be withdrawn.

To summarize the relevant standards that the Examiner must apply when attempting to establish obviousness of claims, 35 U.S.C. §103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007). The question of obviousness is resolved on the basis of the four underlying factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). See also KSR, 127 S.Ct. at 1734, 82 USPQ2d at 1391.

In *KSR,* the Court noted that "[t]o facilitate review, this analysis should be made explicit." KSR, 127 S.Ct. at 1740-41, 82 USPQ2d at 1396. ("[R]ejections on obviousness grounds **cannot be sustained by mere conclusory statements**; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness" (Emphasis added)). However, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, **for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ**." (Emphasis added), *Id.* When making an obviousness rejection, Office personnel must therefore ensure that the written record includes findings of fact concerning the state of the art and the teachings of the references applied.

As alluded to above, and as succinctly summarized in MPEP 2141(II.), the focus when making a determination of obviousness should be on what a person of ordinary skill in the pertinent art **would have known at the time of the invention, and on what such a person would have reasonably expected to have been able to do in view of that knowledge** (emphasis added).

Finally, the Examiner is reminded that impermissible hindsight cannot be used in the obviousness analysis. As reinforced by the U.S. Supreme Court in *KSR*,

> A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham,* 383 U.S. at 36, 86 S.Ct. 684 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to " 'guard against slipping into the use of hindsight' " (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.,* 332 F.2d 406, 412 (C.A.6 1964))).

KSR, 127 S.Ct. at 1742, 82 USPQ2d at 1397.

As the above-summarized standards for weighing obviousness are applied to the instant invention in view of Steigerwald et al. and the JP '986 patent, it is clear that a person of ordinary skill in the art would **never** have arrived at the instant invention based upon the teachings of Steigerwald et al. and the JP '986 patent, and the Examiner's finding of obviousness of the instantly invention as claimed in independent claims 1, 2, 7, and 11 can **only** be the result of impermissible hindsight reconstruction. Such is made clear when the substance of Steigerwald et al. and the JP '986 patent are analyzed for what these references teach and the analysis is made as to what one of skill in the art would have been able to do with the teachings. Specifically, while Steigerwald et al. does teach a process in which particles are structured in a reverse micelle process, the particles are **not** hollow polyhedral fine particles. Rather, the particles produced in the reverse micelle process of Steigerwald et al. are cluster particles.

While the Examiner has recognized the fact that Steigerwald et al. does not teach hollow particles, additional teachings within Steigerwald et al. are relevant for purposes of establishing the nature of the particles produced through the process taught by Steigerwald et al. In particular, as further support for the fact that cluster particles of Steigerwald et al. are not hollow, the bright field transmission electron micrographs of Figure 2 in Steigerwald et al. are indicative only of a crystal structure, and the micrographs do not show the structure of a hollow particle. Further, in Steigerwald et al., organic molecules are firmly fixed via covalent bonds to the surface of cadmium selenide (CdSe) cluster particles, which have high reactivity, in order to stabilize these particles and produce CdSe crystallites (refer to Equation 1 on page 3049 of Steigerwald et al.). These further teachings establish that not only does Steigerwald et al. **not** teach a process for producing hollow particles, **the**

very nature of the particles that are actually produced through the teachings of Steigerwald et al. are cluster particles and the formation of the particular cluster particles is an integral part of the process taught by Steigerwald et al. As such, there is no teaching in Steigerwald et al. to form anything other than cluster particles. Such teachings make it clear that Steigerwald et al. provides no guidance to one of skill in the art as to how to make a hollow particle based on the reverse micelle process taught therein.

Turning to the disclosure of the JP '986 patent, it is true that this reference teaches methods of making hollow spherical structures. However, what the Examiner has failed to recognize is that JP '986 teaches a method of making such particles that is **completely different from reverse micelle processes**. In fact, the JP '986 patent teaches a process for making the hollow spherical structures that involves atomizing precursor droplets into an oven. It is clear that a process of atomizing precursor droplets into an oven is fundamentally different than a reverse micelle process, which occurs in solution.

While the Examiner has attempted to provide rationales to explain how one of skill in the art would have arrived at the instant invention as claimed through the combined teachings of Steigerwald et al. and the JP '986 patent, the Examiner's rationales merely represent a veiled attempt to avoid a completely conclusory position relative to obviousness of the instant claims. Further, the Examiner's rationales have no merit relative to answering the question of **what a person of ordinary skill in the pertinent art would have known at the time of the invention, and on what such a person would have reasonably expected to have been able to do in view of that knowledge**. To explain, the Examiner has made no showing whatsoever as to **why** one of skill in the art would have used the reverse micelle process of Steigerwald et al. to make the hollow particles of the JP '986

patent **in view of the fact that the JP '986 patent does not even teach making the hollow particles taught therein through a process carried out in solution.** For one of skill in the art to arrive at the instant invention "to optimize composition and size of such particles since such would improve final mechanical and chemical properties of such particles", as the Examiner has proposed, **would first require one of skill in the art to even recognize that hollow particles could be made through a process other than the atomizing process taught by the JP '986 patent.** Simply stated, there is no basis whatsoever for the Examiner to conclude that one of skill in the art would have known to make hollow particles of the type taught in the JP '986 patent through the process of Steigerwald et al. when the nature of the process taught in the JP '986 patent is so different from the process taught in Steigerwald et al., when there is no indication whatsoever in the art that hollow particles can be made through processes other than those described in the JP '986 patent, and when every indication of Steigerwald et al. is that the process taught therein is confined to the production of cluster particles having a crystal structure. Further, the Examiner's rationales in support of obviousness of the instantly claimed invention are the product of impermissible hindsight reconstruction of the instant invention as claimed and do not accurately reflect how one of skill in the art would have interpreted the combined teachings of Steigerwald et al. and the JP '986 patent.

The Examiner is respectfully implored to adhere to the proper methodology for establishing obviousness of a claimed invention, in which proper credence is given to the question of what a person of ordinary skill in the pertinent art would have known at the time of the invention, and on what such a person would reasonably have been expected to be able to do in view of that knowledge. Properly performing this analysis makes it clear that

one of skill in the art would **never** have known to make hollow particles through the process taught by Steigerwald et al., and that the JP '986 patent would **not** have provided any further guidance to one of skill in the art other than to establish that it is known to make hollow particles through methods such as atomizing a precursor into an oven. The JP '986 patent provides no guidance whatsoever to one of skill in the art to make such hollow particles through the process taught by Steigerwald et al. In view of these facts, the Examiner must bridge the gap to explain **how** one of skill in the art would have known to use the process taught in Steigerwald et al. to make the particles of the JP '986 patent given the significant differences in the types of processes taught in the JP '986 patent and in Steigerwald et al. and given the lack of any teaching whatsoever in the art that hollow particles could even be made in processes similar to the one taught by Steigerwald et al.

With regard to the rejections of independent claim 7, the Applicants respectfully submit that the Examiner's rejection of this claim over the combination of Steigerwald et al. and the JP '986 patent is also improper. More specifically, claim 7 claims a specific formula for polyhedral fine particles. As made clear above, Steigerwald et al. is irrelevant to the subject matter claimed in independent claim 7 due to the fact that Steigerwald et al. is directed to cluster particles and **not** polyhedral fine particles. With regard to the JP '986 patent, the hollow spherical structures taught therein are different from the particles claimed in claim 7. In addition to the fact that cadmium and selenium are *not even taught* as suitable materials for making the spherical particles in the JP '986 patent, the particles produced in the JP '986 patent are much larger than the particles of the instant invention. Referring to page 4 of the instant application as filed, the hollow polyhedral fine particles of the instant application have a size in which "the distance between two atoms, which are the

furthermost from each other, ranges from 0.1 to 20 nm". In other words, the largest diameter of the particles of the instant application is 20 nm. On the other hand, the particles taught by the JP '986 patent have a diameter of at least 0.1 micron (i.e., 100 nm). These facts prove that the particles claimed in independent claim 7 are neither anticipated by nor obvious in view of the combined teachings of Steigerwald et al. and the JP '986 patent.

In view of the foregoing, the Applicants respectfully submit that the Examiner has failed to properly establish a *prima facie* case of obviousness over the combined teachings of Steigerwald et al. and the JP '986 patent. Therefore, the Applicants respectfully submit that the rejection of claims 1-20 are improper and must be withdrawn. Further, the Applicants submit that claims 1-20 are both novel and non-obvious in view of the prior art and are therefore in condition for allowance, which allowance is respectfully requested.

The Commissioner is authorized to charge our deposit account no. 08-2789 for any additional fees or credit the account for any overpayment.

Respectfully submitted,

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